

CLAIMS

1. Integrated thermoelectric module (10) formed of a set of thermoelectric elements, each of which is made of P type and N type conductor and/or semiconductor elements electrically connected in series and thermally connected in parallel, wherein said thermoelectric elements are electrically connected in series and/or in parallel and thermally connected in parallel and are assembled on flexible supports (11) made of a polymeric material, connected to the respective heat exchangers (12), characterized in that the thermoelectric elements are distributed in the interior of the integrated thermoelectric module (10) so as to geometrically harmonize heat transferred from the integrated thermoelectric module (10) with heat exchanged by the heat exchangers (12) thus making the temperature distribution on said heat exchangers (12) as uniform as possible, in order to maximize the efficiency of the integrated thermoelectric module (10) by reducing the thermal head between its two opposite faces.
2. Integrated thermoelectric module according to claim 1, characterized in that in order to connect said module (10) to heat exchangers (12) a thermally conductive material of phase conversion type (13) is used having high thermal conductivity and capable of absorbing without damages possible irregularities of

the thickness of the integrated thermoelectric module (10) due to height tolerances of the thermoelectric elements.

3. Integrated thermoelectric module according to claim 1,
5 characterized in that in order to connect said module (10) to heat exchangers (12) a thermally conductive graphite material is used, laid either on one face only or on both faces of the integrated thermoelectric module (10).

10 4. Integrated thermoelectric module according to claim 1, characterized in that its base has a rectangular shape, for instance a square shape.

15 5. Integrated thermoelectric module according to claim 1, characterized in that its base has a curvilinear peripheral shape, for instance a circular shape.

6. Integrated thermoelectric module according to claim 1, characterized in that the thermoelectric elements are uniformly
20 distributed inside the integrated thermoelectric module (10).

7. Integrated thermoelectric module according to claim 1, characterized in that the thermoelectric elements are non-uniformly distributed inside the integrated thermoelectric module
25 (10).

8. Integrated thermoelectric module according to claim 1, characterized in that said module is associated with heat exchangers having a planar connection surface.

5 9. Integrated thermoelectric module according to claim 1, characterized in that said module is associated with heat exchangers having a concave and/or convex connection surface.

10 10. Integrated thermoelectric module according to claim 1, characterized in that said module is associated with heat exchangers having a cylindrical shape with polygonal cross section.

15 11. Integrated thermoelectric module according to claim 1, characterized in that said module is associated with heat exchangers having a cylindrical shape with a circular cross section.

20 12. Integrated thermoelectric module according to claim 1, characterized in that the heat exchangers are finned.

25 13. Integrated thermoelectric module according to claim 1, characterized in that the heat exchangers may be touched by gaseous or liquid fluids as well as by fluids that are bound to phase conversion.

14. Integrated thermoelectric module according to claim 1, characterized in that the heat exchangers may be touched by fluids bound to phase conversion.
- 5 15. Integrated thermoelectric module according to claim 1, characterized in that the heat exchangers avail themselves of the latent heat of phase conversion of a fluid.